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**Sociable Robotics: Annotated Bibliography**

Coles, Clifton. "Humanoid Robots: Functional and Fun." *The Futurist* 38.1 (2004): 12-3. *ABI/INFORM Complete; ProQuest Research Library.* Web. 26 Nov. 2012.

In this article by Clifton Coles, the subject of human-like robots is discussed, specifically how they are enjoyable and practical companions. He compares them to cars and makes the notion that, like vehicles, robots will become both a tool and something to play with. Coles’ example of such a creature is Honda’s ASIMO. The ASIMO get’s attention, but greater things are yet to come, states Coles. The author mentions that robots like ASIMO can go places that humans cannot, they can educate and entertain, and they can be a helper to those who need it. But despite this, robots still have an image problem, which he hopes to overcome with ASIMO and future robots.

This article is short and very direct, which seems to be the author’s goal. He makes it clear that robots like ASIMO can do this, this, and this, but clearly states that they have an image problem, which is the main thing that he wants to work on. Coles quotes a lot from a Mr. Hirohisa Hirukawa, a researcher for Japan’s National Institute of Advanced Industrial Science and Technology. These quotes are very important and helpful when talking about what robots can currently do and how Japan hopes to improve their image.

This article, while it is short, lays out numerous positive benefits of robots. These benefits are not always associated with sociable robots specifically, but they all can somehow relate to the research if need be. The benefits listed are in a very general form for this article, and it is a good source of filler information.

Turkle, Sherry. “Alone Together: The Robotic Movement,” *Alone Together: Why We Expect More from Technology and Less From Each Other.* New York: Basic Books, 2011. pp. 3-13. Print. Rpt. in *Writing in the Disciplines: A Reader and Rhetoric for Academic Writers*, 7th ed. Ed. Mary Lynch Kennedy and William J. Kennedy. Boston; Pearson 2012. 322-30. Print.

This article, written by Sherry Turkle, examines the subject of sociable robots in numerous situations. After a previous revelation she had while at a museum with her own child, Turkle explores the relevance and need for sociable robots in everyday life. Such examples include: social media, robot companions, and intimacy involving robots. Through critical analysis, Turkle studies various subjects and situations, like those mentioned above, and then presents the negative and positive outcomes to come from them.

Turkle does not try to hide the fact she opposes how integrated sociable robots have become in society today. With every instance she reports in her article, she immediately refutes said instance with the notion that it is causing negative effects on the overall human ability to communicate and interact with others face-to-face. Her arguments are very intelligent and well thought out, especially during the section over social networking.

This article, as well as other articles written by Turkle, will come in handy when the need to have a counterargument arises. Turkle takes on many of the subtopics that will be talked about in the final research paper. The part where she elaborates on robotic companions, in both a romantic and child-like form, are great sources of rebuttal for the paper. The area of humanoid robotics is talked about today and this article is where one would be able to find many pros and cons about sociable robots.

Sherry Turkle, et al. "Relational Artifacts With Children And Elders: The Complexities Of Cybercompanionship." Connection Science 18.4 (2006): 347-361. Academic Search Premier. Web. 10 Dec. 2012.

In this article, a team of researchers bring a group of both children and senior citizens to together and present them with commercially successful toys such as My Real Baby, Furbys and Paros. During this trial, the researches look at two things: the “Rorschach effect” and to see if both sets of individuals can actively reflect on the “aliveness” of the toy. The Rorschach effect is simply a reflection test. By using the toys, the researchers are looking to see if the subjects will reflect hidden emotional conflicts or other internal affairs. The part where they assess the patient’s ability to reflect on the realness of the toy involves the subject actively questioning the concept of the toy. An example of such a question would be, “Can it talk?”

This is a fantastic article. It covers both the negative and positive sides of close and personal robotic relationships. Since it covers both children and older adults, this article is very credible and unbiased. The information is also presented in an unbiased form since different researchers compiled it. During the latter half of the article, there are individual stories from the experiments. Some of these stories are told from small children, no older than 10 years of age, other stories are told from people as old as 74 years of age. The intimate detail included in these stories, as well as actual dialogue from the experiment, acts as an extremely credible support.

This article is a bountiful source of information that is useful for the research paper. It covers a wide range of individuals and is unbiased in both the experimentation and presentation of data. The personal stories from a few of the subjects will act as support for statements included in the final draft. One could see the dialogue in some of the more intimate stories acting as very persuasive information in the final paper.

Alex, M. Andrew. "Designing Sociable Robots." *Kybernetes* 32.9 (2003): 1559-61. *ProQuest Research Library.* Web. 11 Dec. 2012.

This article talks about the physical aspects of a social robot, specifically humanoid robots. This is a review of a book called *Designing Sociable Robots* by Cynthia L. Breazeal. In this book, the physical attributions of robots are key when they are attempting to make connections with humans. Many references to science fiction are made, mainly from Star Trek. The eyes, facial expressions, color and movement are all physical attributes addressed in this article. A simple change in any of these, according to the author, can make a huge difference in how the robot is perceived by the general public.

The article is very specific in which colors, eye movements, and other features work best when interacting with humans. There is a lot of consideration from both the general side of things and also from the side of personal use. There are two paragraphs that really show deep insight in how the sociable robot should look and act in order to interact effectively: the one about movement and the one about facial expressions. A very good line from this article would be that the ‘overall appearance is undoubtedly a representation of a face, but in a caricature-like way and not flesh-colored. It is mentioned that there was a conscious decision not to try to imitate a face in detail since people have an instinctive unease when faced with something that seems human but is not fully so.” This sets up an argument made by Turkle in “Alone Together: The Robotic Movement.”

At some point during the research, the need to talk about the physical characteristics of sociable robots will surely arise. During those segments, this article will become a great asset to have. The paragraphs about facial expressions and movement are very specific in what is needed and those statements will act as useful background information for the reader.

Hiroshi Ishiguro, et al. "Interactive Robots As Social Partners And Peer Tutors For Children: A Field Trial." Human-Computer Interaction 19.1/2 (2004): 61-84. Academic Search Premier. Web. 11 Dec. 2012.

Robots are capable of educational while still maintaining a sociable status. In this article, robots were placed in first and sixth grade Japanese classrooms for an 18-day period and allowed to interact socially with the students. During this time, the robots also worked with the students on English speaking skills. During the first week of the robots’ presence in the classroom, overall interaction with the machine was very high. But after that initial week, interaction dropped sharply, but never fully dissipated. At the end of the 18-days, the students were tested on the English that they had been learning from the robot. The studies showed that the more time a child had spent with the robot, the more English that they learned. The predispositions of the students also played a role in the statistics. If a student had previously known a little English, they performed substantially better, with the help of the robot, than those who had no prior English knowledge

This was a very interesting article because it talked about both the sociable and academic pros and cons to robotics. During the beginning half of the article, the authors talked about how the level of interaction between the students and the robot. They also noted the physical attributes, much like the previous article, that led to the children interacting with the robot. Every little detail is recorded in this article including the classroom setting, how many students were involved, and the placement of recording devices. There are also very organized and informational charts showing the changes in English scores and how those relate to the time spent with the robots. The charts also note that the first graders spent a significantly longer time interacting than the sixth graders.

This article not only presents numerous positive benefits to sociable robots, but also presents how they can be used in an academic setting, which, presumably, would be very appealing to many readers. Since the adult readers of this research are more likely to be critical of the benefits it will pose on their friends and loved ones, this information should give them a sense of ease. The information observed in this article clearly demonstrates that robots in the classroom had very positive results, as well as positive interactions with the children involved.

Ishiguro, Hiroshi, and Minoru Asada. “Humanoid and Android Science.” *IEEE Intelligence Systems,* July/Aug. 2006: 74-76. Web. Rpt. in *Writing in the Disciplines: A Reader and Rhetoric for Academic Writers*, 7th ed. Ed. Mary Lynch Kennedy and William J. Kennedy. Boston; Pearson 2012. 322-30. Print.

This article takes on notion that the appearance and behavior of a humanoid or android robot effects the overall perception people have about them. The authors note that, when designing, making sure that the robot is more human looking has always been a top priority. After talking about the importance of the psychical appearance of the robots themselves, the article goes on to explain the psychological factors that their appearance effects.

“How can we define human likeness? Furthermore, how do we perceive it?” This is a very good point brought up by the article. During the latter part of the article, the authors go on to note that synergistic intelligence is one of the new humanoid-science frameworks being used to better the relationships between robots and humans. This paragraph really relates the two ideas that the article presents together. According to the process of synergistic intelligence, physical appearance and interaction affect the psychological growth of both the human and robot alike. This helps humans to perceive the robot in a better light and, in turn, allows the robot to interact more efficiently with society. Again, this paragraph really brings the two ideas together into something that gets to the point and is easy to understand.

The information in this article is very supportive of the idea of sociable robots. While it does not dive into the benefits specifically, the article does talk about the psychological and physical attributes of sociable robots and how they affect the perceptions of the human that they interact with. This acts as an excellent source of support when talking about the intimate relationships between humans and humanoid robots. Talking about the psychological aspects will prove to be a very persuasive segment of information.

Shaw-Garlock, Glenda. “Looking Forward to Sociable Robots.” *International Journal of Social Robotics 1.3* (2009): 249-60) Web. Rpt. in *Writing in the Disciplines: A Reader and Rhetoric for Academic Writers*, 7th ed. Ed. Mary Lynch Kennedy and William J. Kennedy. Boston; Pearson 2012. 322-30. Print.

In this article, the main idea is perception. The work looks at social robots in Japan and in North America and compares and contrasts the two on how they are perceived culturally. The article looks at both utilitarian and affective robots during the analysis. Along with the history of social robots in both the Japanese and American culture, the article includes information regarding embodied and social intelligence, morphology (the for and structure of the robot), aesthetics (the mind’s reaction to nature and beauty), and moral equivalence.

The author of this article does a very good job in explaining the benefits of sociable robots in two different cultures: Japanese and American. The article notes the preconceptions of robots in both cultures and describes how those views have changed over the years due to innovation and experience. For instance, America was vastly more cautious in embracing robotics than Japanese because of what the author calls “Frankenstein fears.” Having the sections on moral equivalence and aesthetics really makes the article more intriguing, as well as personal, because of the psychological and ethical connections it makes between humans and robotics.

If the need to make a cultural differentiation comes forth during the research paper, then this article will be a very good source to go to, because it offers up ethical arguments against sociable robotics, this article can also serve as an argument against the thesis presented in the research. While not entirely credible, ethical arguments are important to a large portion of the audience reading this research and having them involved in the final draft could make the overall paper very leveled and unbiased.

Sharkey, Noel. “The Ethical Frontiers of Robotics.” *Science 322.5909* (19 Dec. 2008): 1800-01. Web. Rpt. in *Writing in the Disciplines: A Reader and Rhetoric for Academic Writers*, 7th ed. Ed. Mary Lynch Kennedy and William J. Kennedy. Boston; Pearson 2012. 322-30. Print.

This article talks about two specific areas of robotics that are becoming increasingly important in recent years: the care of children, as well as elderly, and the development of robotic weapons by the military. The article then presents several scenarios where robot caregivers and robotic weapons are present in today’s society.

The article does not support the notion of robotic caregivers and weapons and uses various ethical arguments to counteract the statements made in the article. For example, with elderly individuals, “robots can help [them] to maintain independence in their own homes, but their presence could lead to the risk of leaving the elderly in the exclusive care of machines. The elderly need the human contact that is often only provided by caregivers and people performing day-to-day tasks for them.” The article sets up a scenario and then argues against it ethically. The same pattern is mirrored in child caregiving and in military operations.

Since a lot of the articles being used talk about the effects of sociable robots on children and the elderly, this article isn’t that special. But since this article includes robotics in the world of weapons, it becomes useful when talking about moral equivalences and cultural preconceptions. For example, as with weapons, the “ethical problems arise because no computational system can discriminate between combatants and innocents in a close-contact encounter.”

Goodman, Kenneth W., and Norman G. Einspruch. “The Way Forward in the World of Robotics.” *Science* 324.5926 (24 Apr. 2009): 463-64. Web. Rpt. in *Writing in the Disciplines: A Reader and Rhetoric for Academic Writers*, 7th ed. Ed. Mary Lynch Kennedy and William J. Kennedy. Boston; Pearson 2012. 322-30. Print.

This short article by Kenneth Goodman is a response to the previous article. Goodman’s main point is to criticize Sharkey for doing the job of ethics, which he describes as “[being] limited to worst-case scenarios. Goodman and Einspruch want Sharkey to wait for the empirical evidence before placing ethical constraints on the use of autonomous weapons, development, and application. Afterwards, Sharkey responds to the statement saying that he disagrees with the two authors and that we cannot wait to think ethically because it is already happening.

This article is a commentary on the “Ethical Frontiers of Robots.” Goodman thinks that Sharkey exaggerated his claims about robotic weaponry and caregiving. Goodman also accuses Sharkey of relying on “invoking threats of child neglect and abuse” to keep his audience away from sociable robots. While this article is very short, the commentary holds good form and structure and is very fair in its delivery. Sharkey’s rebuttal is the say way.

The use of this article in research is evident because the article talks about the fears of people—something that they have a hard time dealing with when confronted with robots. Goodman makes a great point about not relying on ethics to prove a certain view and, instead, relying on “identification, analysis of challenges, precautions, constraints, and trade-offs required to perfect safety, povac, and liberty.” This quote will hopefully be in the final draft of the research paper: *“History has taught is that once a technological genie is out of the bottle, we can’t get it back again.”*